

Deconstructing iCloud Drive: What Techs Must Know.

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iCloud vs. iCloud Drive:
What's the difference?

What is iCloud?

- “iCloud gives you access to your music, photos, contacts, calendars, documents, and more from your Mac, iPhone, iPad, iPod touch, and Windows computer. iCloud stores your content and automatically keeps it up to date on all your devices. iCloud is easy to set up on your devices, and it’s easy to use with the apps included with your Mac and iOS devices, as well as the apps on [iCloud.com](https://www.icloud.com).” - Apple

What is iCloud Drive?

- Pretty much just the “Documents-and-Data” bit of iCloud.

Two minute history lesson.



(2000)



(2002)

mobile*me*

(2008)



(2011)

iCloud Drive today



Requires iOS 8 and/or Yosemite.

iCloud Drive today



Requires iOS 8 and/or Yosemite.

Why?

iCloud Drive today

- iOS is kind of a big deal.
- In iOS, all files created by an app are saved inside that app's container.
- With iOS 8, Apple is letting developers make those containers visible.
- If you use Pages on iPad, you could open/edit/import a document saved on iCloud Drive, created on your Mac.

iCloud Drive today

Once you've updated to iOS 8/Yosemite and enabled iCloud Drive, you've jumped into the new ecosystem. **You can't go back!**

Upgrading to iCloud Drive when you're pre-iOS 8 or Yosemite means your data won't sync. You shouldn't lose anything except convenience.

The Good Stuff.

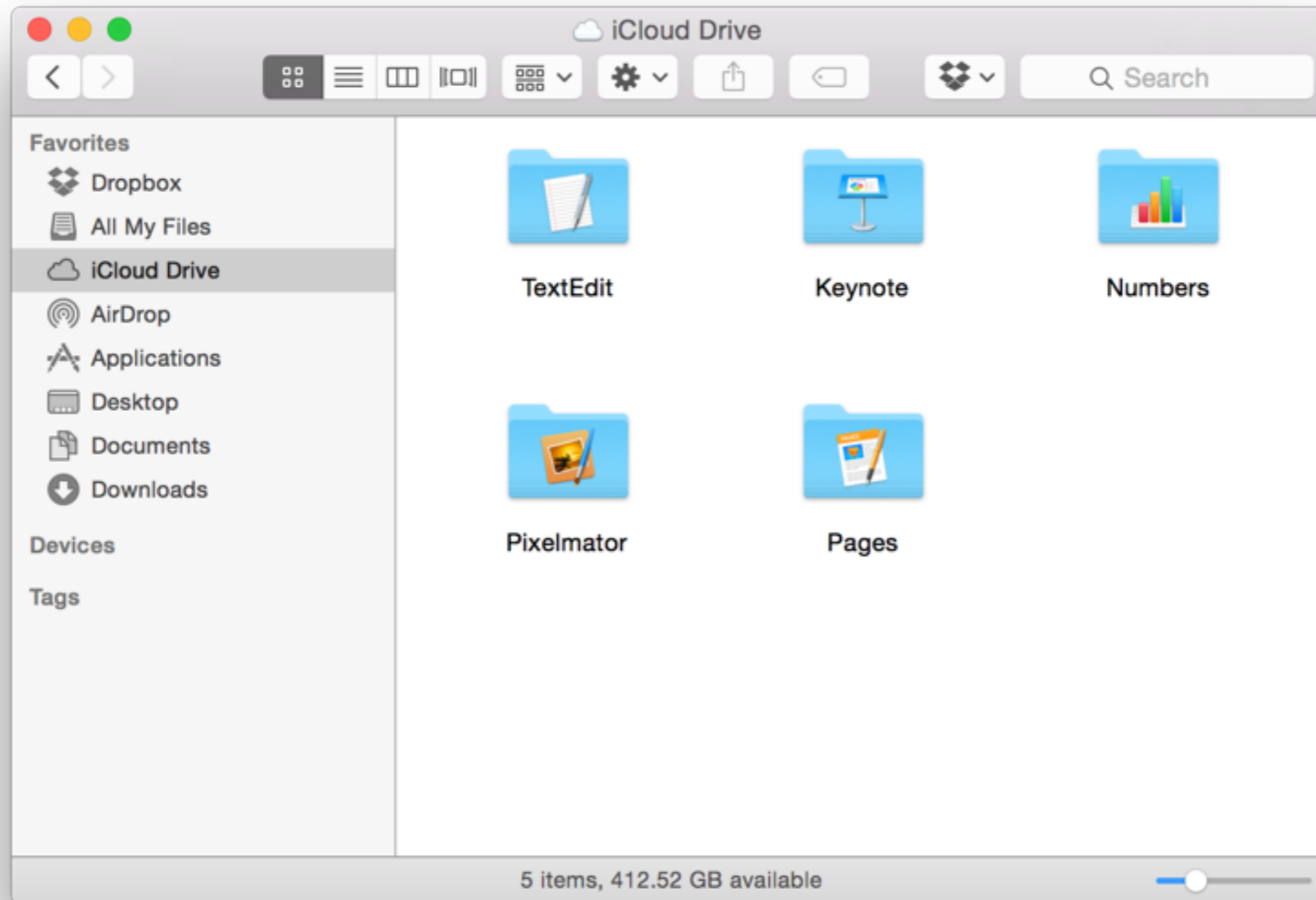
What's stored where on Mac OS X.

- User data is ostensibly stored in `~/Library/Mobile Documents` – just like in 10.7+
- Contains folders specific to iCloud-enabled applications, as well as other user-addressable folders.
- Easy access from the Finder via Finder sidebar and “Go” menu.
- None of that is exactly accurate.

Huh?

- Folders in `~/Library/Mobile Documents` aren't actually folders. Can't "Get Info".
- Hitting the "iCloud Drive" link in the Finder/"Go" menu takes you to iCloud Drive, not that directory.

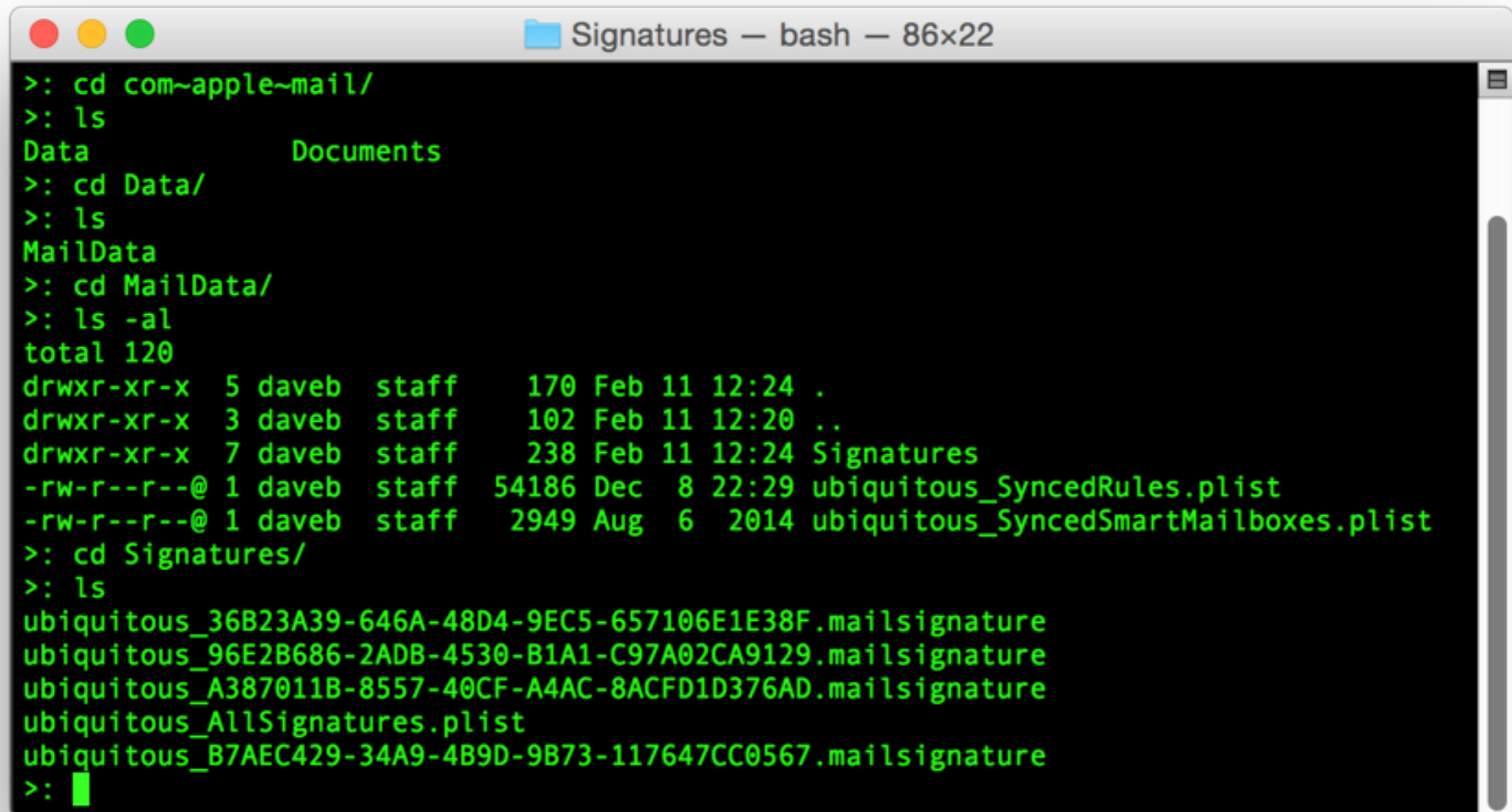
Finder:



Terminal:

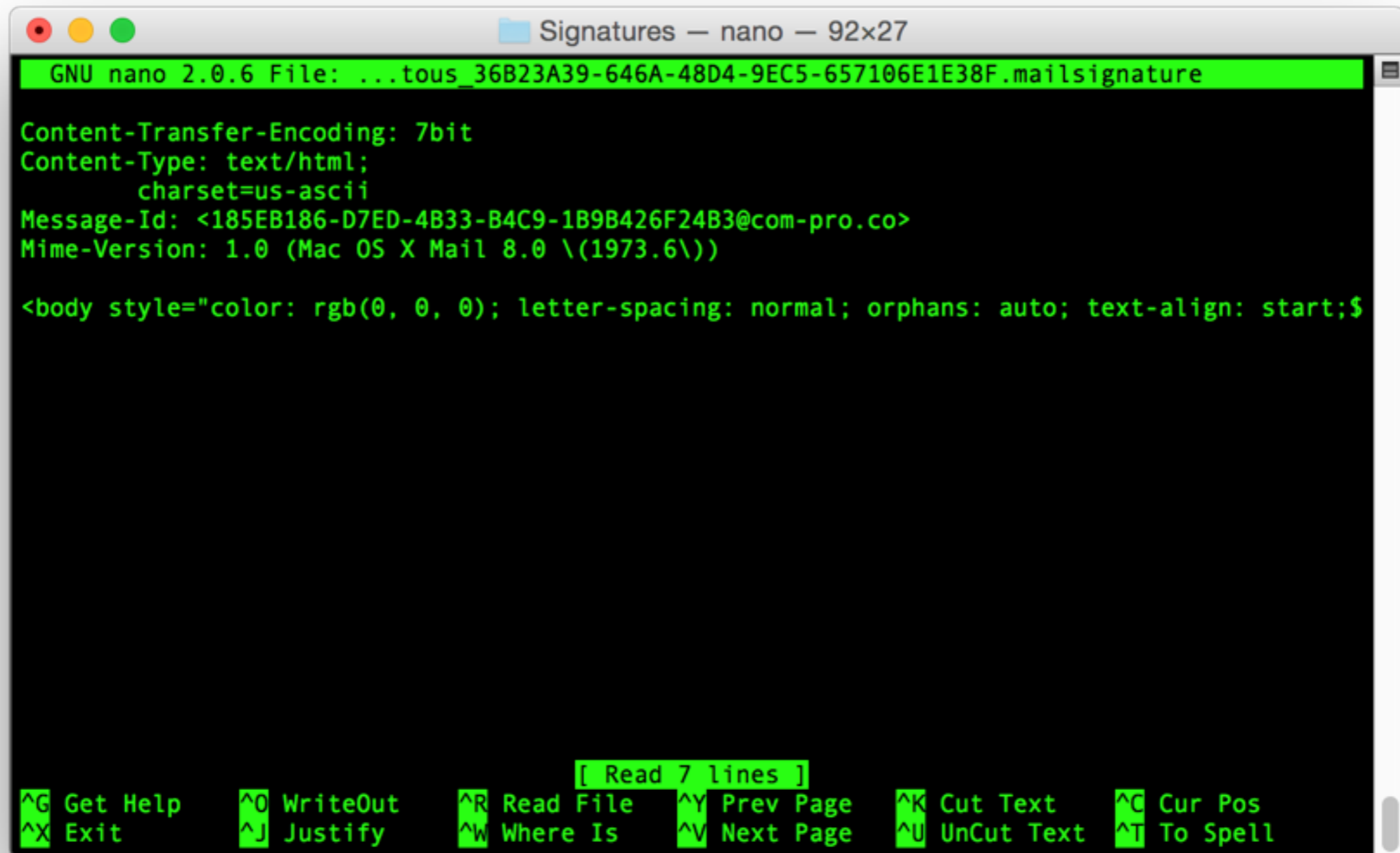
```
Mobile Documents — bash — 91x23
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 com~apple~Automator
drwxr-xr-x  3 daveb  staff   102 Feb 25 19:53 com~apple~CloudDocs
drwxr-xr-x  8 daveb  staff   272 Feb 16 19:42 com~apple~Keynote
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 com~apple~Notes
drwxr-xr-x  7 daveb  staff   238 Feb 11 12:21 com~apple~Numbers
drwxr-xr-x 12 daveb  staff   408 Feb 23 13:15 com~apple~Pages
drwxr-xr-x  5 daveb  staff   170 Feb 25 14:53 com~apple~Preview
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 com~apple~QuickTimePlayerX
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 com~apple~ScriptEditor2
drwxr-xr-x  4 daveb  staff   136 Feb 16 19:42 com~apple~TextEdit
drwxr-xr-x  4 daveb  staff   136 Feb 11 12:21 com~apple~TextInput
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 com~apple~finder
drwxr-xr-x  4 daveb  staff   136 Feb 11 12:20 com~apple~mail
drwxr-xr-x  5 daveb  staff   170 Feb 23 13:06 com~apple~shoebox
drwxr-xr-x  4 daveb  staff   136 Feb 11 12:20 com~apple~system~spotlight
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:23 iCloud~com~apple~ncplugin~weather
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 iCloud~com~getdropbox~Dropbox
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 iCloud~com~microsoft~Office~Excel
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 iCloud~com~microsoft~Office~PowerPoint
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 iCloud~com~microsoft~Office~Word
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 iCloud~com~panic~iOS~Transmit
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:19 iCloud~com~schimera~WebDAVNavigatorPlus
>:
```

Things get weird...



```
>: cd com~apple~mail/
>: ls
Data                                Documents
>: cd Data/
>: ls
MailData
>: cd MailData/
>: ls -al
total 120
drwxr-xr-x  5 daveb  staff   170 Feb 11 12:24 .
drwxr-xr-x  3 daveb  staff   102 Feb 11 12:20 ..
drwxr-xr-x  7 daveb  staff   238 Feb 11 12:24 Signatures
-rw-r--r--@ 1 daveb  staff 54186 Dec  8 22:29 ubiquitous_SyncedRules.plist
-rw-r--r--@ 1 daveb  staff  2949 Aug  6  2014 ubiquitous_SyncedSmartMailboxes.plist
>: cd Signatures/
>: ls
ubiquitous_36B23A39-646A-48D4-9EC5-657106E1E38F.mailsignature
ubiquitous_96E2B686-2ADB-4530-B1A1-C97A02CA9129.mailsignature
ubiquitous_A387011B-8557-40CF-A4AC-8ACFD1D376AD.mailsignature
ubiquitous_AllSignatures.plist
ubiquitous_B7AEC429-34A9-4B9D-9B73-117647CC0567.mailsignature
>: █
```

Things get weird...



The image shows a macOS-style window titled "Signatures — nano — 92x27". The window contains a nano 2.0.6 text editor editing a file named "...tous_36B23A39-646A-48D4-9EC5-657106E1E38F.mailsignature". The editor's content consists of several lines of text: "Content-Transfer-Encoding: 7bit", "Content-Type: text/html; charset=us-ascii", "Message-Id: <185EB186-D7ED-4B33-B4C9-1B9B426F24B3@com-pro.co>", "Mime-Version: 1.0 (Mac OS X Mail 8.0 \ (1973.6\))", and "<body style='color: rgb(0, 0, 0); letter-spacing: normal; orphans: auto; text-align: start;\$". At the bottom of the window, a status bar displays "[Read 7 lines]" and a series of keyboard shortcuts: ^G Get Help, ^O WriteOut, ^R Read File, ^Y Prev Page, ^K Cut Text, ^C Cur Pos, ^X Exit, ^J Justify, ^W Where Is, ^V Next Page, ^U UnCut Text, and ^T To Spell.

```
GNU nano 2.0.6 File: ...tous_36B23A39-646A-48D4-9EC5-657106E1E38F.mailsignature

Content-Transfer-Encoding: 7bit
Content-Type: text/html;
    charset=us-ascii
Message-Id: <185EB186-D7ED-4B33-B4C9-1B9B426F24B3@com-pro.co>
Mime-Version: 1.0 (Mac OS X Mail 8.0 \ (1973.6\))

<body style="color: rgb(0, 0, 0); letter-spacing: normal; orphans: auto; text-align: start;$

[ Read 7 lines ]
^G Get Help  ^O WriteOut  ^R Read File  ^Y Prev Page  ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is   ^V Next Page  ^U UnCut Text ^T To Spell
```

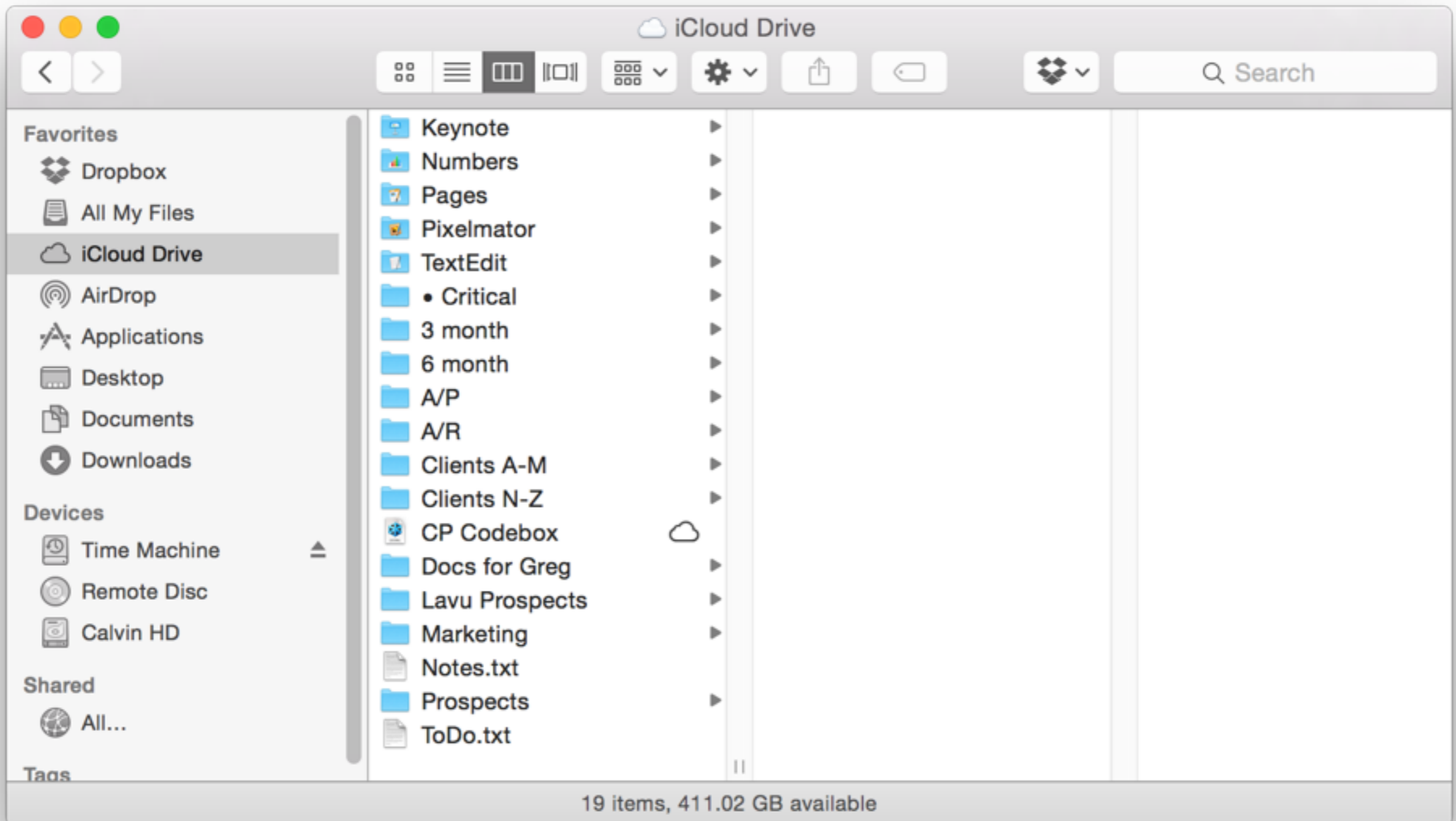
!=Folders - Application Libraries.
(or Ubiquity Container)

What the heck is a “Ubiquity Container”?

- Any app eligible for the App Store can use the iCloud document store.
- If it's written to take advantage of iCloud it can access directories synced and controlled by iCloud - these are called Ubiquity Containers.
- Communication between iCloud and Ubiquity Containers is handled by the Ubiquity Daemon (`ubd`).

iCloud Drive Workflows

(or: If it looks like a duck, does it quack like a duck?)



- iOS/OS X apps enabled for iCloud Drive use default to using their app libraries.

- Other apps treat

`~/Library/Mobile Documents/com~apple~CloudDocs/.`

as a regular directory.

What's stored where on iOS 8.

- No legitimate file system access (jailbroken can poke around).
- Some legitimate third party apps e.g., CloudOpener
- Tapping “+” in enabled app takes you to document picker - some ability to browse.

What's stored where on The Cloud™.

Ultimately, all your iCloud Drive data lives on
Apple's servers.

What's stored where on The Cloud™.

Ultimately, all your iCloud Drive data lives on
Apple's servers.

...or does it?

Demo time

(Or: How I had fun with `nettop`).

So, what's actually going on here?

- Files dropped into/saved into iCloud Drive
- `bird` daemon kicks in, fires up `NSURLSession` to upload the file
- `bird` cannot be run manually, but can be managed by `brctl`

More Demos!

(Or: How I had fun with `brct1`).

So, it's basically Dropbox, right?

No. Well, kinda. But mostly “No”.

iCloud vs. Dropbox vs. Google Drive vs. One Drive



Google Drive

- 15GB free, 100GB \$1.99/month, 1TB \$9.99/month, all the way up to 30TB \$299.99/month.
- Apps for Mac/PC/Android/iOS/Web.
- Store/access anything.

iCloud vs. Dropbox vs. Google Drive vs. One Drive



OneDrive

- 15GB free, 100GB \$1.99/month, 200GB \$3.99/month, 1TB \$6.99/month (inc. Office 365).
- Support for Office Online, Office 365.
- Excellent collaborative tools, Windows Phone support.

iCloud vs. Dropbox vs. Google Drive vs. One Drive



Dropbox

- 2-16 GB free, 1TB \$9.99/month. Business users \$15/user/month.
- Robust tools for group collaboration.
- Simple, cross-platform & ubiquitous.

iCloud vs. Dropbox vs. Google Drive vs. One Drive



iCloud Drive

- 5GB free, 20GB \$0.99/month, 200GB \$3.99/month, 500GB \$9.99/month, 1TB \$19.99/month.
- Works with Mac/Windows/iOS/Web.
- Part of the iCloud ecosystem.
- Space used for app data, **iOS Backups**

iCloud vs. Dropbox vs. Google Drive vs. One Drive

If you want simple, flexible manageable cloud storage, choose **Dropbox**.

If you want inexpensive cloud storage with good basic apps/integration, choose **Google Drive**.

If you want excellent integration into Microsoft's ecosystem, choose **OneDrive**.

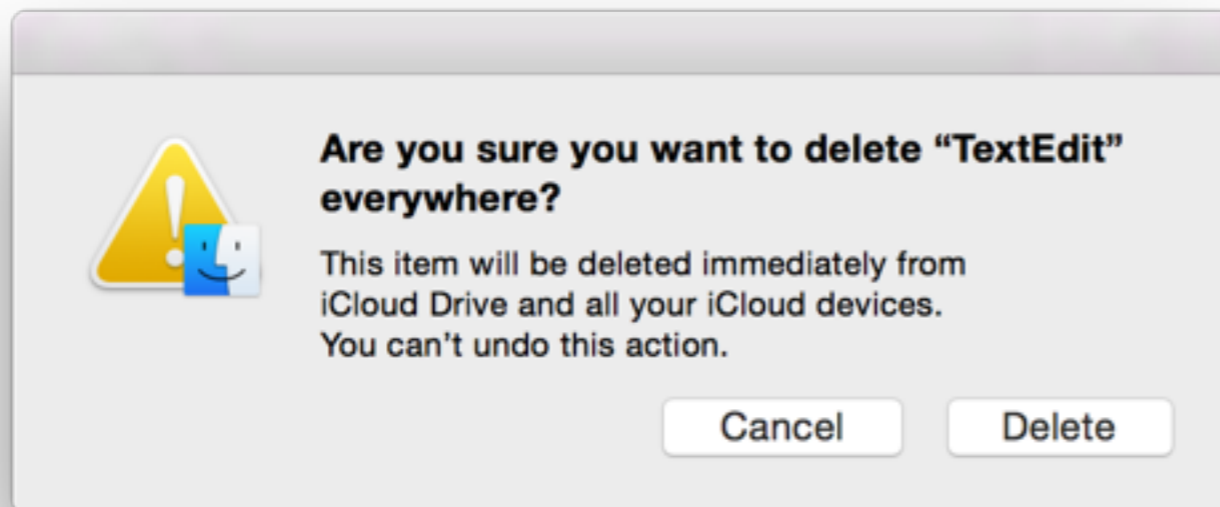
If you want excellent integration into Apple's ecosystem, choose **iCloud**.

Google Drive and Dropbox are great for sharing stuff with **other people** - OneDrive and iCloud Drive are great for sharing stuff between **your own devices**.

How to break iCloud Drive*

* Don't try this at home.

Accidental deletion of App Libraries.



< - - BAD LOL!1!

File & location corruption

- iCloud daemon works on top of CloudKit. Server-side API, iCloud daemon asynchronous.
- It never assumes that a file is only being accessed/used by one device at a time.
- If lightning strikes, you can restore from another device.

No revisions/undelete.

- iCloud Drive doesn't keep multiple revisions. Be careful.
- iCloud Drive doesn't allow undelete. Be careful.

No revisions/undelete.

- iCloud Drive doesn't keep multiple revisions. Be careful.
- iCloud Drive doesn't allow undelete. Be careful.
- BYO Backup!

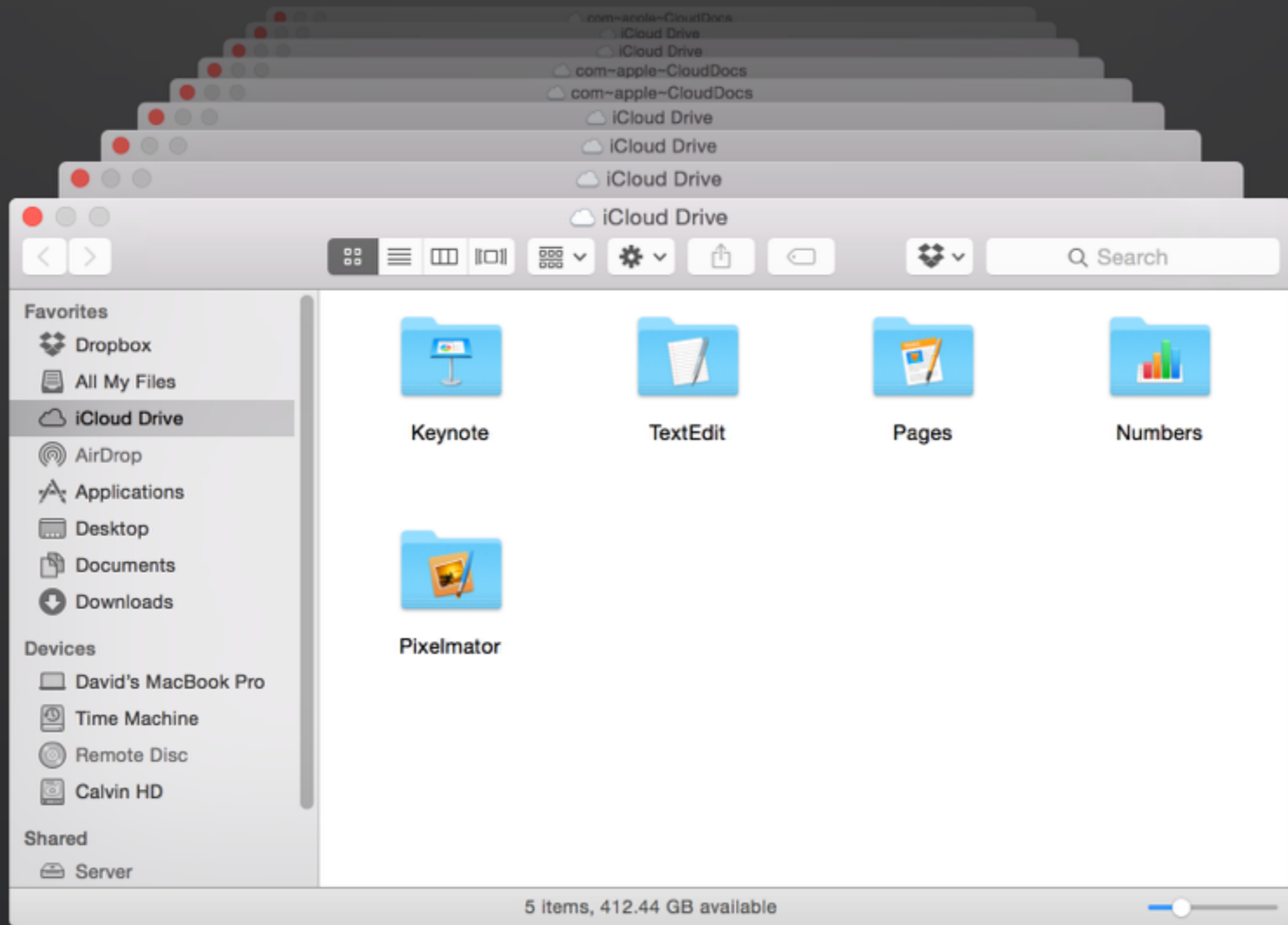
Know your network configuration

- iCloud Drive lives and dies by port 80 & 443
- Just as with iCloud, be aware of proxies/DNS issues
- Ditto, filtering.

Check Processes & Permissions

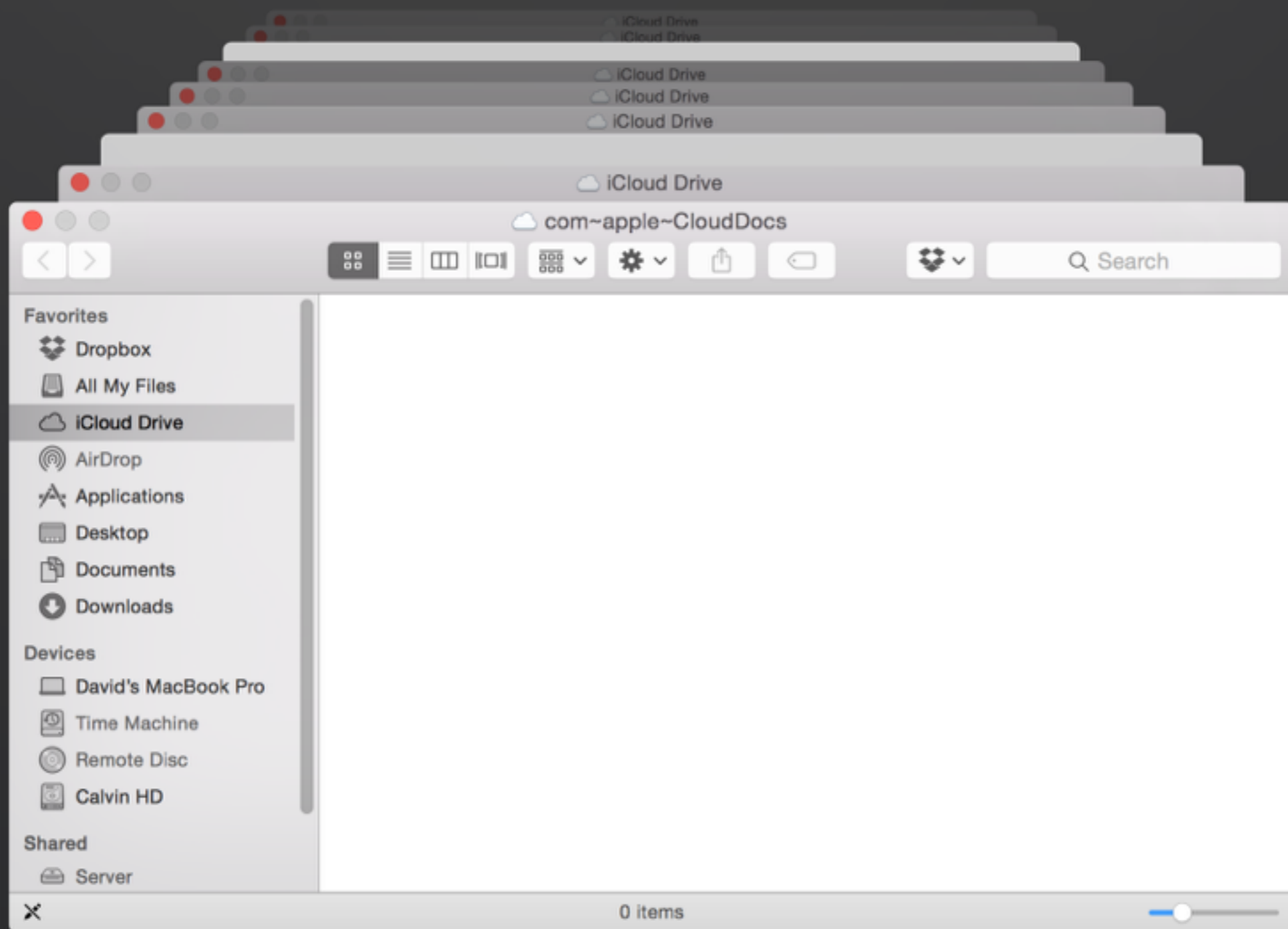
- Beware runaway processes (`bird/cloud/NSURLsessiond`)
- Sync failures trend with `~/Library` permissions issues
- File sizes - iCloud Drive limit of 15GB

iCloud Drive & Time Machine



Today (Now)

Cancel Restore

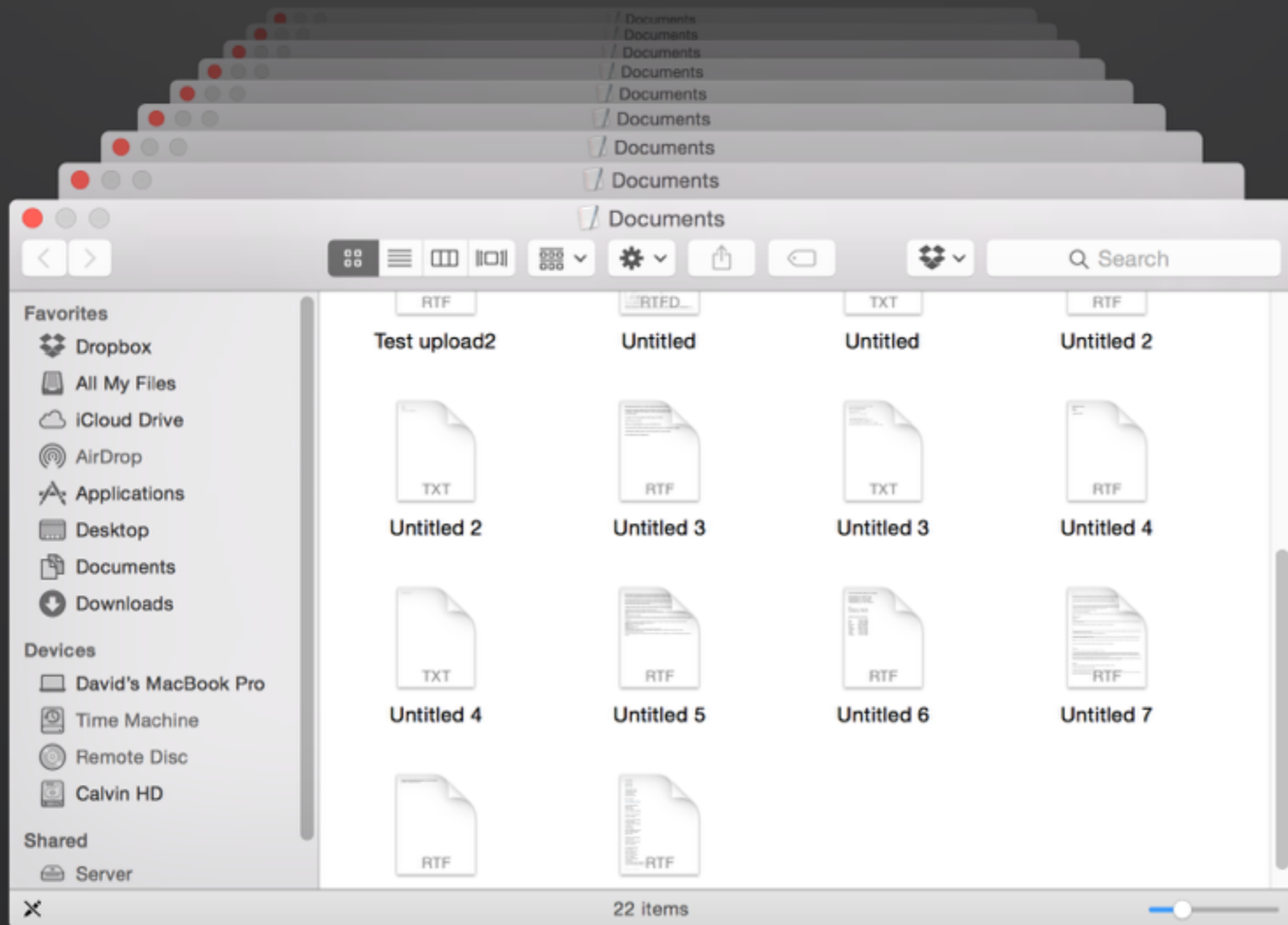


Today at 9:34 PM



Cancel

Restore



Today at 7:58 PM



Cancel

Restore

Third Party backups

- Rocky start, but most utilities (Crashplan, Backblaze etc will backup `~/Library/Mobile Documents`.
- Just like Time Machine, you may have to do some digging into those App Libraries.
- Think about what you're putting back - it will sync to all the devices.
- Sync != Backup.

Is it safe to use yet?

Yes *

* Your mileage may vary.

- <http://support.apple.com/en-us/HT201104>
- <http://support.apple.com/en-us/HT204025>
- <http://support.apple.com/en-us/HT201385>
- <http://www.apple.com/legal/internet-services/icloud/en/terms.html>
- man pages for `nettop` & `brctl`